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Mr. R. Rashapov  
Project Officer, Nuclear Processing Facilities Division  
Canadian Nuclear Safety Commission  
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Canada  
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### **Subject: Disposition of CNSC Staff Comments on SRBT's 2016 Annual Compliance and Performance Report**

Dear Mr. Rashapov,

Thank you for CNSC staff's letter [1] noting that the SRBT Annual Compliance and Performance Report for 2016 had been accepted by CNSC staff. As requested, the purpose of this letter is to address the comments and recommended improvements that were itemized in the attachment to this letter.

CNSC comments are repeated in ***bold italics*** followed immediately by SRBT's response.

#### **Comment 1 – Section 2.1.1:**

***In section 2.1 and 2.1.5 SRBT states that non-conformances and opportunities for improvement were identified through internal and external audits, self-assessments, benchmarking, amongst others. SRBT raised a total of 63 non-conformance and 36 OFIs in 2016. Requested action: Please provide a general statement on the effectiveness of the implemented corrective actions.***

As of today, 61 out of the 63 non-conformance reports (NCRs) raised in 2016 had undergone a review of the effectiveness of the implemented corrective actions. The remaining 2 NCRs have yet to have corrective actions implemented due to the relative longer term timeframes for the actions that are to be taken to resolve the issues identified.

Of the 61 NCRs that have completed an effectiveness review, 58 were determined to have had actions taken that were effective at addressing the problem. The three that were determined to have had associated actions that failed / were not effective were all relating to product quality (i.e. the problems were not directly associated with any licenced activities or safety-related issues – missing sign mounting hardware, incorrect legend on sign, defective incoming sign frames).

For opportunities for improvement (OFIs), 34 out of the 36 raised in 2016 have been reviewed for effectiveness, with all having been evaluated as being effective in achieving the improvement identified. The remaining two OFIs were assigned target completion due dates that have not yet been reached, and will be reviewed as per normal processes once the responsible individual addresses the OFI.

SRBT affirms that corrective actions and opportunities for improvement have been effective at resolving problems and promoting the concept of continual improvement within our management system in 2016.

**Comment 2 – Section 2.1.2:**

***There are references in section 2.2.2 of the ACMOPR that do not have supporting information. Ex.: SAT-HP-01 and SAT-HP-04. Requested action: Please provide supporting information regarding the implementation status of SAT-HP-01 and SAT-HP-04.***

SAT-HP-01, *Advanced Health Physics Instrumentation*, has completed the design phase, with the establishment and acceptance of a learning assessment program. The activity is currently in the development phase (writing of trainee manuals, tests, on-the-job training checklists, etc.), championed by the Manager – Health Physics and Regulatory Affairs. The materials package is expected to be ready for review and acceptance by the Training Committee before the end of October.

SAT-HP-04, *Bioassay and Dosimetry*, has completed the development phase of the training program materials. Trainee manuals, on-the-job training (OJT) checklists, and written tests have all been designed and developed, with a development matrix being completed that demonstrates adherence to the learning assessment plan established during the design phase. The associated tests and OJT checklists have been developed to ensure that safety-critical enabling objectives are correctly weighted to ensure an appropriate level of learning is assessed in these areas. The inaugural iteration of this training activity is expected to be implemented in the coming weeks.

In both cases, these activities continue to be conducted solely by Health Physics Team members who were qualified under previous training processes.

**Comment 3 – Section 2.1.2:**

***SRBT appears to mismatch terms such as “SAT-based activities” and “categorized activities” and “original activities” and “key tasks”. Requested action: Please provide clarification on the use of the terms SAT-based activities, categorized activities, original activities and key tasks.***

Upon first implementation of the Training Program Manual in 2015, seven processes were originally defined as requiring the application of a systematic approach to training. These seven processes are, or will be associated with seven systematically generated training ‘activities’ once the first cycle of the program is completed.

The text of the report uses ‘SAT-based activities’ and ‘categorized activities’ in a synonymous fashion. ‘Original activities’ refers to any one of the original seven analyzed processes identified as requiring a systematic approach to training in the initial analysis. The term ‘key tasks’ does not appear in section 2.2.2 of the 2016 report; as such, we cannot clarify this particular term.

**Comment 4 – Section 2.3.1:**

***In section 4.1.5 and Appendix D, SRBT provided an analysis of the dose results for the year 2016, including a discussion on any emerging trends related specifically to the maximum dose, average dose and collective dose compared with past years. This analysis was performed for each group of workers: those who primarily work in Zone 3, Zone 2, Zone 1, and in administration. In Appendix D, the table indicates that the doses are the average quarterly collective dose; however, it would appear that these are representative of the average annual dose. Requested action: SRBT is requested to clarify if the reported doses in appendix A are representative of quarterly or annual averages.***

Several metrics are presented in the tables included as part of Appendix D. The values in the rows associated with 'Average Quarterly Collective Dose' are calculated by summing the total accumulated effective dose for all workers included in each group for each of the four quarters, then taking the average of those four quarterly summed values.

**Comment 5 – Section 2.3.1:**

***For Commission reporting purposes, CNSC staff are required to provide the dose results of contractors who performed work activities at SRBT in 2016. Requested action: SRBT is requested to provide the average annual dose information for contractors.***

SRBT does not typically employ contract staff to perform work that presents a significant radiological hazard. In 2016, seven screening bioassay samples were obtained and measured from contracted tradespersons who provided maintenance support in areas other than Zone 1. None of these samples exceeded our internal screening criteria requiring the calculation of effective dose. To summarize, no contractor received a recordable dose due to activities performed at our facility in 2016.

**Comment 6 – Section 2.3.1:**

***SRBT has not provided a summary of improvements to their RP program in the 2016 ACPR. In 2015, this information was captured in section 4.1.8 of the report, titled "Summary of Radiation Protection Program Improvements". Requested action: SRBT is requested to provide a summary of the RP program improvements in 2016.***

In 2016, the following improvements were implemented with respect to the Radiation Safety Program at SRBT:

- An additional portable tritium-in-air monitor was procured for use by staff.
- The remote display units (RDUs) were commissioned and installed on the gaseous effluent monitoring systems.
- A power conditioning system and a regulated, uninterruptable power supply was commissioned and installed on the liquid scintillation counting equipment.
- A process review was undertaken to optimize the radiological safety of the management of time-expired products.

- An array of in-house passive air samplers were set up to trend average tritium-in-air concentrations throughout targeted areas of the facility. Procedure RSO-040 was designed and implemented to control this activity, which continues as a routine component of the program.
- Several procedure revisions were implemented, including facility contamination assessment and bioassay procedures.
- The implemented tritium trap valve design change not only reduced emissions and increased reliability, but it also resulted in a reduction in the amount of tritium workers are exposed to when handling and using tritium traps during processing operations.
- All key metrics associated with worker dose trended downward significantly due to continued vigilance and adherence to the ALARA principle throughout the organization.

Overall, SRBT's Radiation Safety Program continues to provide an effective level of radiological protection to our workers, and continues to be improved over time.

**Comment 7 – Section 2.3.1:**

***In section 3.3 and 4.1.10, SRBT notes that with one exception, all equipment associated with radiation protection at SRBT performed acceptably in 2016 and all maintenance activities were performed as required. Requested action: SRBT is requested to provide further information on the one exception where radiation equipment did not perform acceptably.***

The information provided on page 77 in Section 4.1.10 pertaining to the removal from service of three of the eight available portable tritium-in-air monitors due to either reaching the end of their expected life span or due to damage beyond reasonably cost-effective repair is what was being referred to as the 'one area of exception' in the first paragraph of that section.

**Comment 8 – Section 2.3.1:**

***In Section 4.3.1.4 (Downspout Runoff Monitoring, page 86), SRBT states that the results indicate that all but two of the downspout runoff monitoring measurements fall below 100 Bq/L. However, it is not until reading Appendix J can the reader determine that 100 Bq/L is the detection limit of analysis. The text in section 4.3.1.4, and elsewhere were applicable, should clearly state when results are at or below detection limit. Requested action: It is recommended that in future annual compliance reports that sample results that are at or below the detection limit be clearly indicated as such in both the main document and the relevant appendix.***

In future reports, SRBT will ensure that any measurements that are at or below the limit of detection of the measurement process are clearly indicated as such throughout the text and appendices.

**Comment 9 – Section 2.3.1:**

***In section 4.3.1.5 (Produce Monitoring, page 87) SRBT notes that in 2016, SRBT included an analysis of organically-bound tritium (OBT) concentrations in produce samples where sufficient material allowed. The results were used in the calculation of public dose included in the annual compliance report. It was not clearly indicated in the report whether the analysis of produce samples for OBT would continue in future annual compliance report, if sample size permitted. Requested action: SRBT is requested to clarify if the analysis of OBT will continue in future compliance reporting.***

Requirements pertaining to the analysis of OBT in both commercial and residential produce have been incorporated into our procedures.

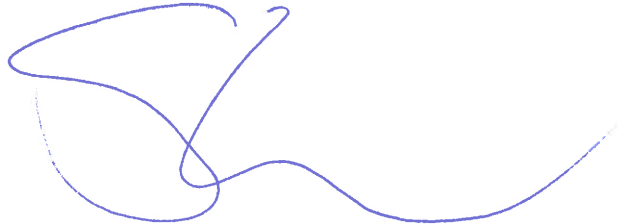
EMP-005, *Commercial Produce Monitoring – Field Sampling*, and EMP-006, *Residential Produce Monitoring – Field Sampling* both discuss the routine annual sampling and analysis of the levels of organically bound tritium in at least one type of consumable plant.

As such, SRBT confirms that the analysis of OBT will continue in future monitoring of produce.

In closing, thank you again for the comments and feedback on the 2016 annual report. We trust that the information provided here clarifies the noted areas, and will incorporate recommendation in future reports.

If you require any additional information, please do not hesitate to contact me at any time.

Best Regards,



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